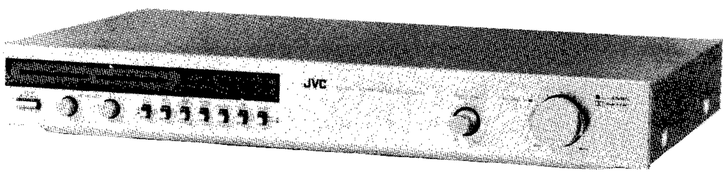
SERVICE MANUAL

MODEL

NR-50 A/B/C/E/J/U

NOISE REDUCTION UNIT



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Features

1. Built-in DOLBY C NR system
2. Built-in Super ANRS, ANRS/DOLBY B NR systems
3. MPX filter
4. Calibration system
   for recording – 400 Hz OSC circuit
   for playback – Calibration volume and indicator (5 LED x 2)
5. Output level control

Specification

NR system : DOLBY C NR, Super ANRS and DOLBY B NR
Channel : 2 channels
Frequency response : 20 Hz – 20,000 Hz ± 1 dB
Distortion : 0.12% (400 Hz, DOLBY C NR level, Harmonic distortion)
Effect of NR : (Cassette deck use)
  Improvement of S/N;
    The S/N is improved by approx. 15 dB at 500 Hz, and approx. 20 dB above 1 kHz – 10 kHz with DOLBY C NR on, and by 10 dB above 5 kHz with ANRS/DOLBY B on.
  Improvement of MOL;
    The MOL is improved by 4 dB at 10 kHz
Effect of Super ANRS: (normal tape)
  Improvement of S/N;
    The same as with ANRS/DOLBY B NR
  Improvement of frequency response;
    0 dB recording; 6 dB at 10 kHz
    +5 dB recording; 12 dB at 10 kHz
  Improvement of distortion;
    0 dB recording; 3% or less at 10 kHz
    +5 dB recording; 3% or less at 10 kHz
Input terminals : LINE (x 2); 80 mV
  (Input impedance; 70 kΩ)
  TAPE PLAY (x 2); 150 mV
  (Input impedance; 60 kΩ)
Output terminals : LINE (x 2); 0–0.5 V
  (Output impedance; 2.3 kΩ)
  TAPE REC (x 2); 0.5 V
  (Output impedance; 1.5 kΩ)
Power requirement : AC 240/220/120 V, 50/60 Hz
Power consumption : 30 W
Dimensions : 420(W) x 60(H) x 252(D) mm
  16-5/8"(W) x 2-5/8"(H) x 10"(D)
Weight : approx. 3.0 kg (6.6 lbs)
Accessory : Pin cord x 2

Design and specifications are subject to change without notice.

DOLBY is trademark of Dolby Laboratories.

Controls and Connections

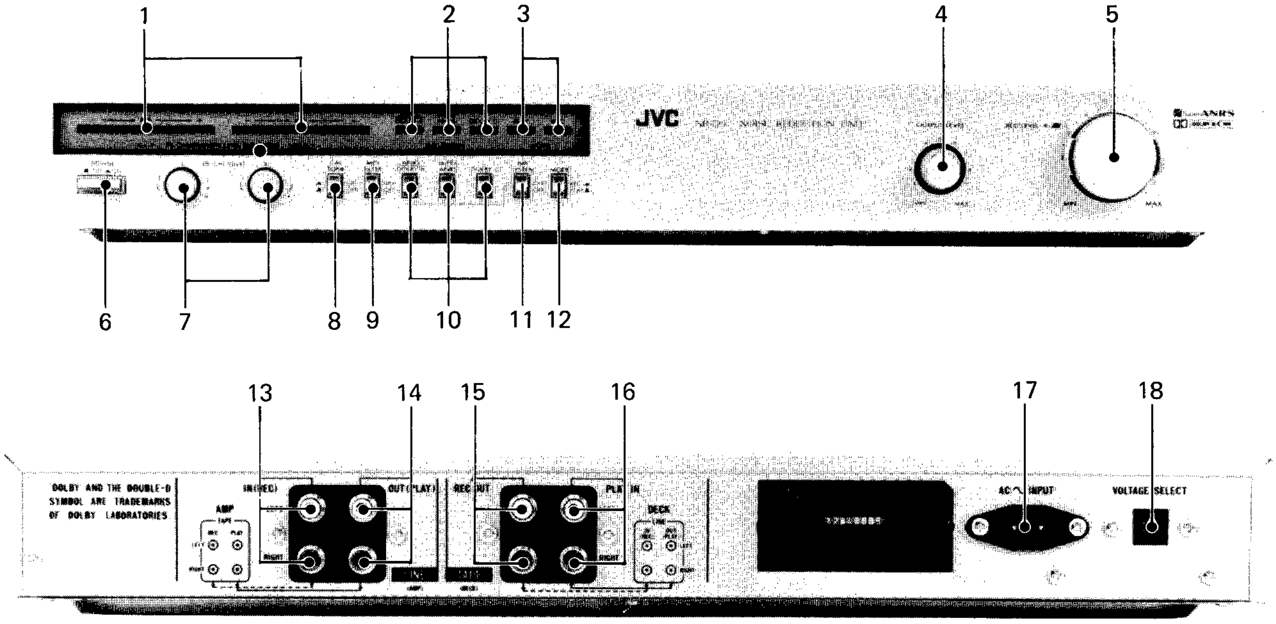

1
2
3
4
5
JVC
6
7
8
9
10
11
12
13
14
15
16
17
18
DOLBY AND THE DOUBLE-D SYMBOL ARE TRADEMARKS OF DOLBY LABORATORIES
AMP
IN (REC)
OUT (PLAY)
REC OUT
PLAY IN
DECK
RIGHT
AC INPUT
VOLTAGE SELECT

Fig. 1

1. PB CALIBRATION LEVEL INDICATOR
2. NR SYSTEM indicator (ANRS/DOLBY B – SUPER ANRS – DOLBY C)
3. MODE indicator (PLAY – REC)
4. OUTPUT LEVEL control
5. REC (recording) LEVEL control
6. POWER switch
7. PB CAL (calibration) LEVEL control
8. CAL TONE switch
9. MPX FILTER switch
10. NR SYSTEM selector (ANRS/DOLBY B – SUPER ANRS – DOLBY C)
11. NR ON/OFF switch
12. MODE switch (REC – PLAY)
13. Input terminals for amplifier
14. Output terminals for amplifier
15. Output terminals for deck
16. Input terminals for deck
17. Inlet
18. Voltage selector

Main Parts Location

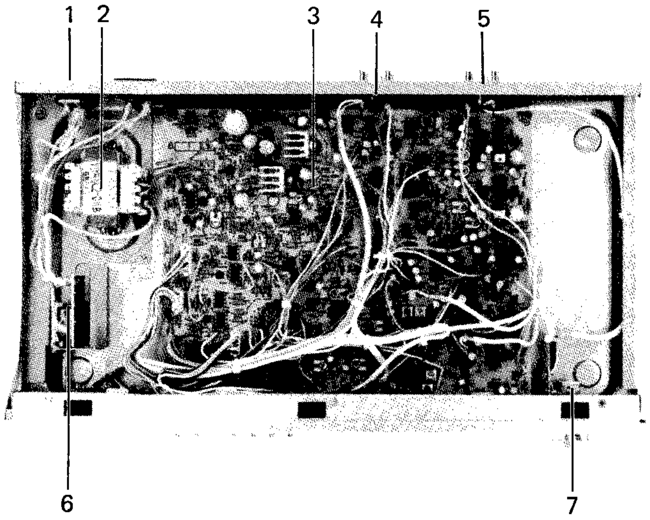


Fig. 2

1. Inlet
2. Power transformer
3. Main P.W. Board assembly
4. Terminals for deck
5. Terminals for amplifier
6. Power switch
7. Recording level control

Description on New Technology

Dolby* C-Type Noise Reduction System:
Noise is reduced and MOL increased dramatically.

The Dolby C-type closely resembles the B-type in operation, the system compatible with ANRS, yet offers even better performance and more distinctive features. Namely:

- It provides about 20 dB above 1 kHz, and 15 dB even at 500 Hz of noise reduction.
- At 10 kHz (at 0 VU recording), it improves MOL by 4 dB maximum.
- It is immune to undesirable side effects, such as modulation noise and breathing.
- Finally, it is tolerant of noise reduction encode/decode errors. Level matching is not critical.

(*Dolby is a trademark of Dolby Laboratories, Inc.)

The basis of C-type noise reduction

Dolby C noise reduction solves the problem of achieving a large amount of compression and expansion without introducing undesirable side effects by the use of two processing stages in series, each supplying 10 dB of compression during recording and of expansion during playback. These circuits operate at independent levels. One, identified as the high-level stage in Figure 5, is sensitive to signals at about the same levels as Dolby B-type noise reduction, while the other, the low-level stage, operates on signals of somewhat lower level. Because the two stages operate in tandem with each other, their effect is to multiply the signals (or add and subtract in dB's), so that a total of 20 dB of compression and expansion, and thus of noise reduction, is accomplished. Yet simultaneously, at no time is the signal subject to the vagaries of a single compression or expansion action of 20 dB. In other words, the tandem two-level, two-stage configuration provides a much more accurate control of the signal than a single compander circuit would be able to achieve.

Two conventional Dolby B IC circuits are used in a modified way in C-type noise reduction to carry out the two-level, two-stage scheme. Thus a desirable side benefit of C-type noise reduction is that it can be executed from the beginning with readily available and economical parts (the development of a dedicated Dolby C integrated circuit in the future would, however, simplify incorporating C-type NR in products). Furthermore, one of the two stages can be easily configured to provide the B-type characteristic at the push of a switch, so cassette decks incorporating C-type noise reduction can be economically equipped with Dolby B NR as well for perfect compatibility with existing B-type recordings.

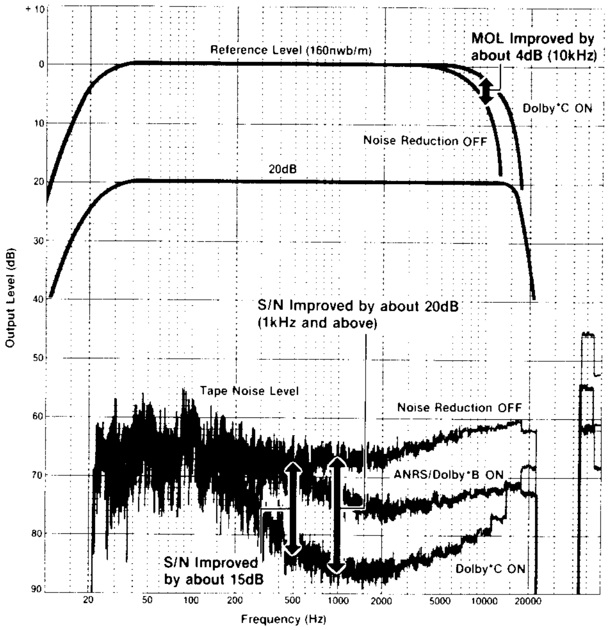


Fig. 3 Dolby* C Improvement

Other developments

In addition to two-level processing, Dolby C-type noise reduction incorporates a number of further innovations. Two of these, shown in Figure 5 as anti-saturation and spectral skewing networks, are carefully calculated frequency response modifications introduced in the encoding (record) process and reciprocally compensated for in the decode (playback) process. Their purpose is two-fold: to further guard against audible side effects, and to ensure the practicality of the system in day-to-day consumer use. The specific benefits of these innovations include the reduction of encode-decode errors and a reduction of upper-middle and high frequency tape saturation and its side effects, such as high frequency losses and intermodulation distortion. Together with the two-level, two-stage configuration, these new developments result in a 20 dB noise reduction system at least as free of side effects as the 10 dB B-type system, and one which is just as practical in day-to-day use.

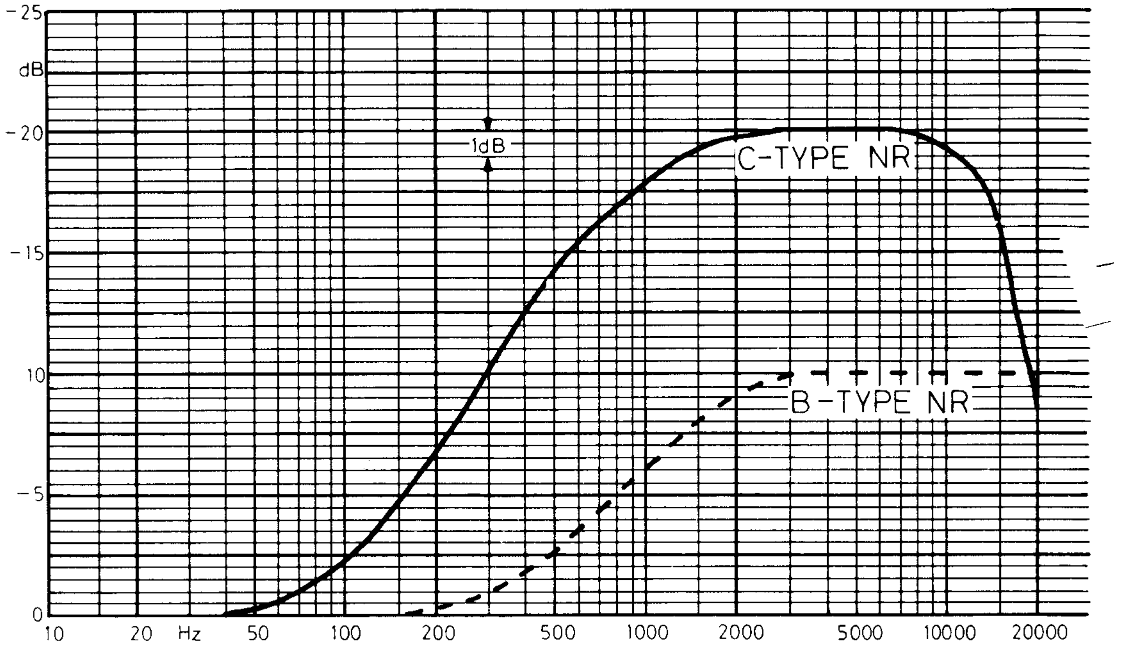
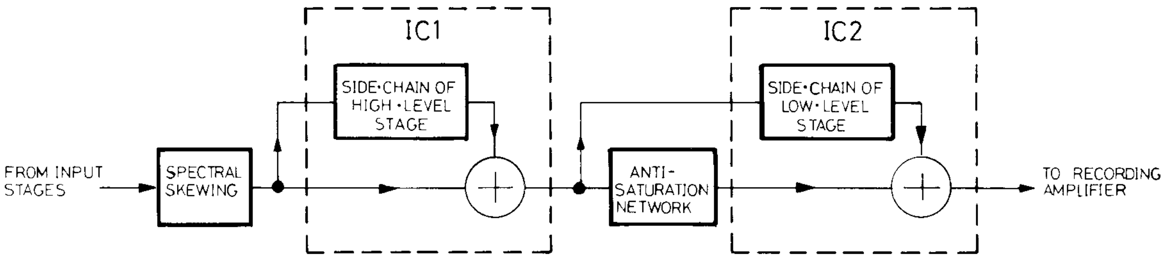
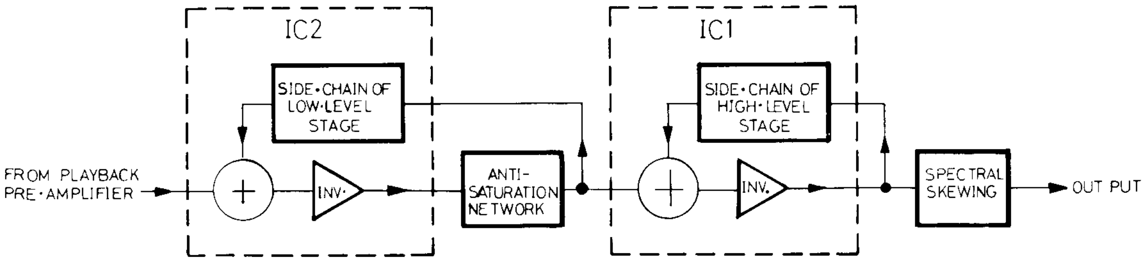


Fig. 4 Low-level encoding frequency response

These curves, showing the maximum low-level boost imparted by both C-type and B-type noise reduction in the absence of high frequency signals, illustrate some of the similarities and differences between the two systems. Dolby C noise reduction imparts more boost in recording and more cut in playback, thus providing more noise reduction. The effect also extends about two octaves lower with C-type noise reduction to maintain subjectively uniform noise level across the spectrum. Processing at very low frequencies is not required with either system because low frequency noise is insignificant in properly engineered cassette recorders.


IC1
SIDE·CHAIN OF HIGH·LEVEL STAGE
IC2
SIDE·CHAIN OF LOW·LEVEL STAGE
FROM INPUT STAGES
SPECTRAL SKEWING
ANTI-SATURATION NETWORK
TO RECORDING AMPLIFIER

DOLBY C-TYPE ENCODER


IC2
SIDE·CHAIN OF LOW·LEVEL STAGE
IC1
SIDE·CHAIN OF HIGH·LEVEL STAGE
FROM PLAYBACK PRE·AMPLIFIER
INV·
ANTI-SATURATION NETWORK
INV.
SPECTRAL SKEWING
OUT PUT

DOLBY C-TYPE DECODER

Fig. 5 Dolby C-type NR block diagram

Removal of the main parts

1. **Top cover**
   Remove 4 screws ① (each side, 2 pcs.).

2. **Bottom cover**
   Remove 7 screws ②.

3. **Front plate assembly**
   1) Pull off the knobs;
      2 calibration level knobs ③
      An output level knob ④
      Left and right input level knobs ⑤
   2) Remove 4 screws ⑥;
      Upper side ..... 3 pcs.
      Bottom side ... 1 pc.

4. **Main P.W.B. assembly**
   1) Remove 2 screws ⑦ fastening the switch ass'y.
   2) Remove a washer and a nut ⑧ fastening the shaft of output level VR.
   3) Remove 3 screws ⑨ fastening the main P.W.B. on rear side.
   4) Pull off the main P.W.B. ass'y to rear side.

5. **Indicator P.W.B. ass'y**
   1) Remove a screw ⑩ fastening the indicator P.W.B. on the front plate inside.
   2) Remove 2 pawls on the front plate inside for indicator P.W.B.

6. **Power transformer**
   Remove 2 screws ⑪.

7. **Power switch**
   Remove 2 screws ⑫.

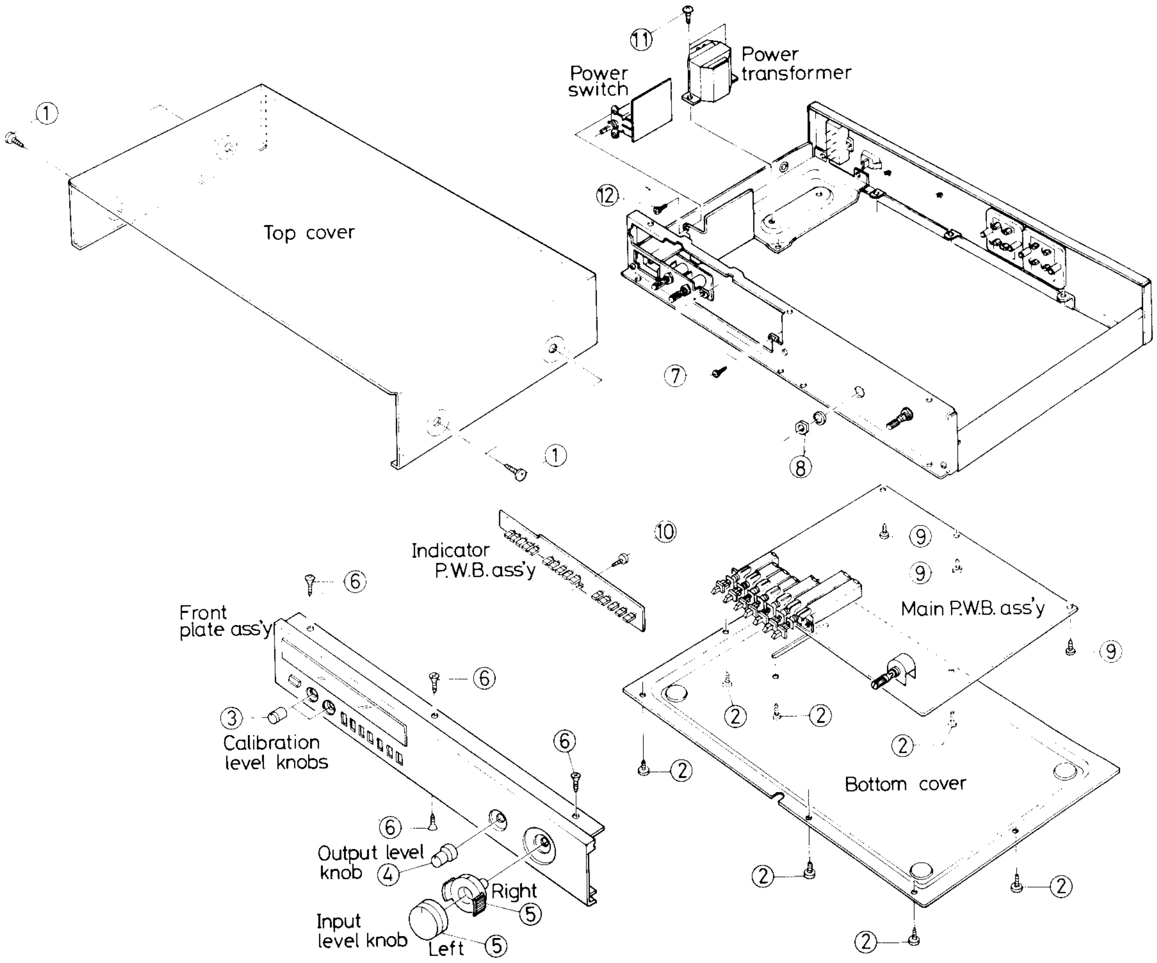
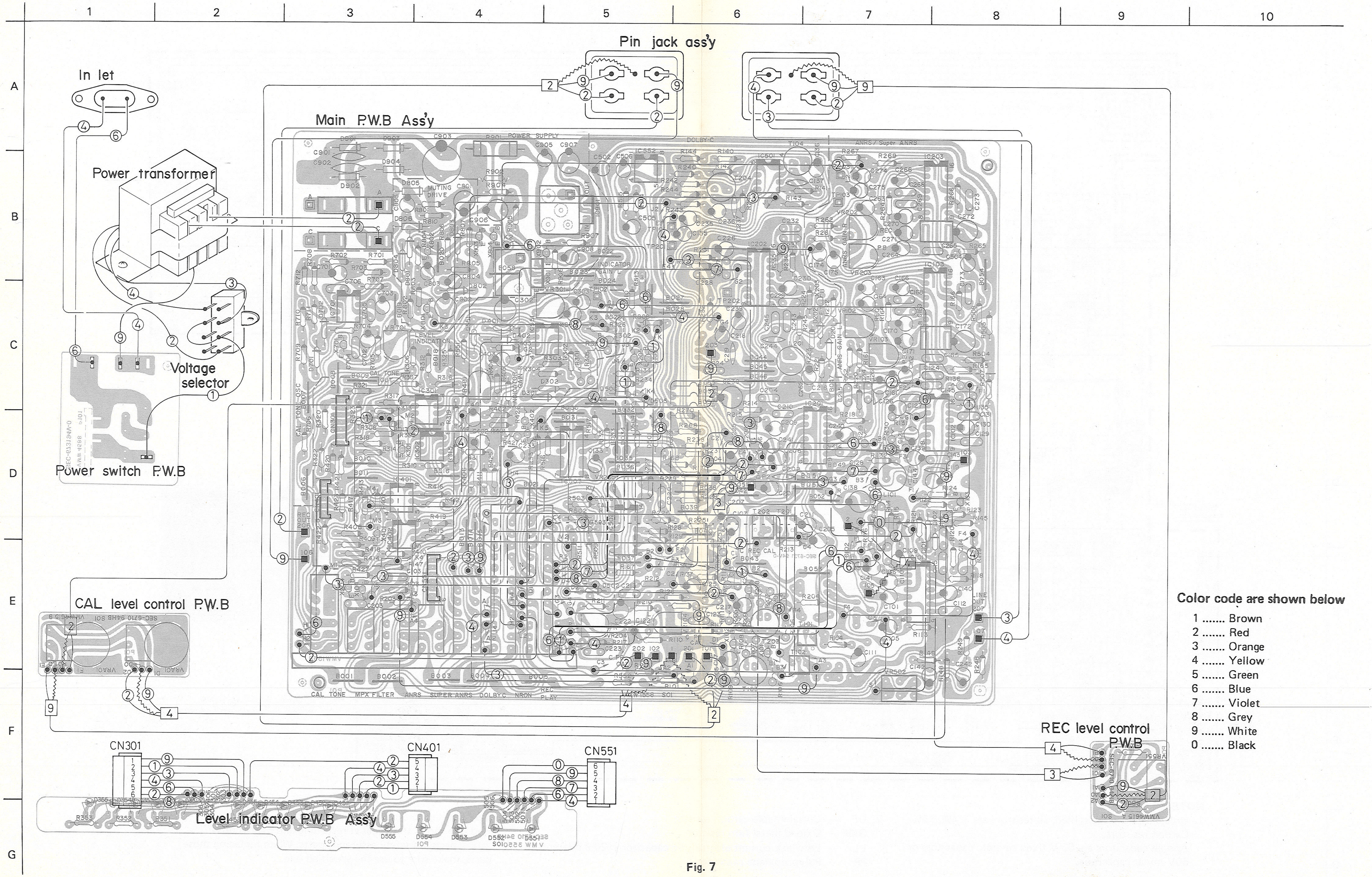

⑪
Power switch
Power transformer
①
Top cover
⑫
⑦
①
⑧
⑩
Indicator P.W.B. ass'y
⑨
⑨
Main P.W.B. ass'y
⑨
⑥
Front plate ass'y
⑥
③
Calibration level knobs
②
②
②
⑥
②
Bottom cover
⑥
Output level knob ④
Right ⑤
Input level knob
Left ⑤
②
②
②

Fig. 6

Wiring Connector

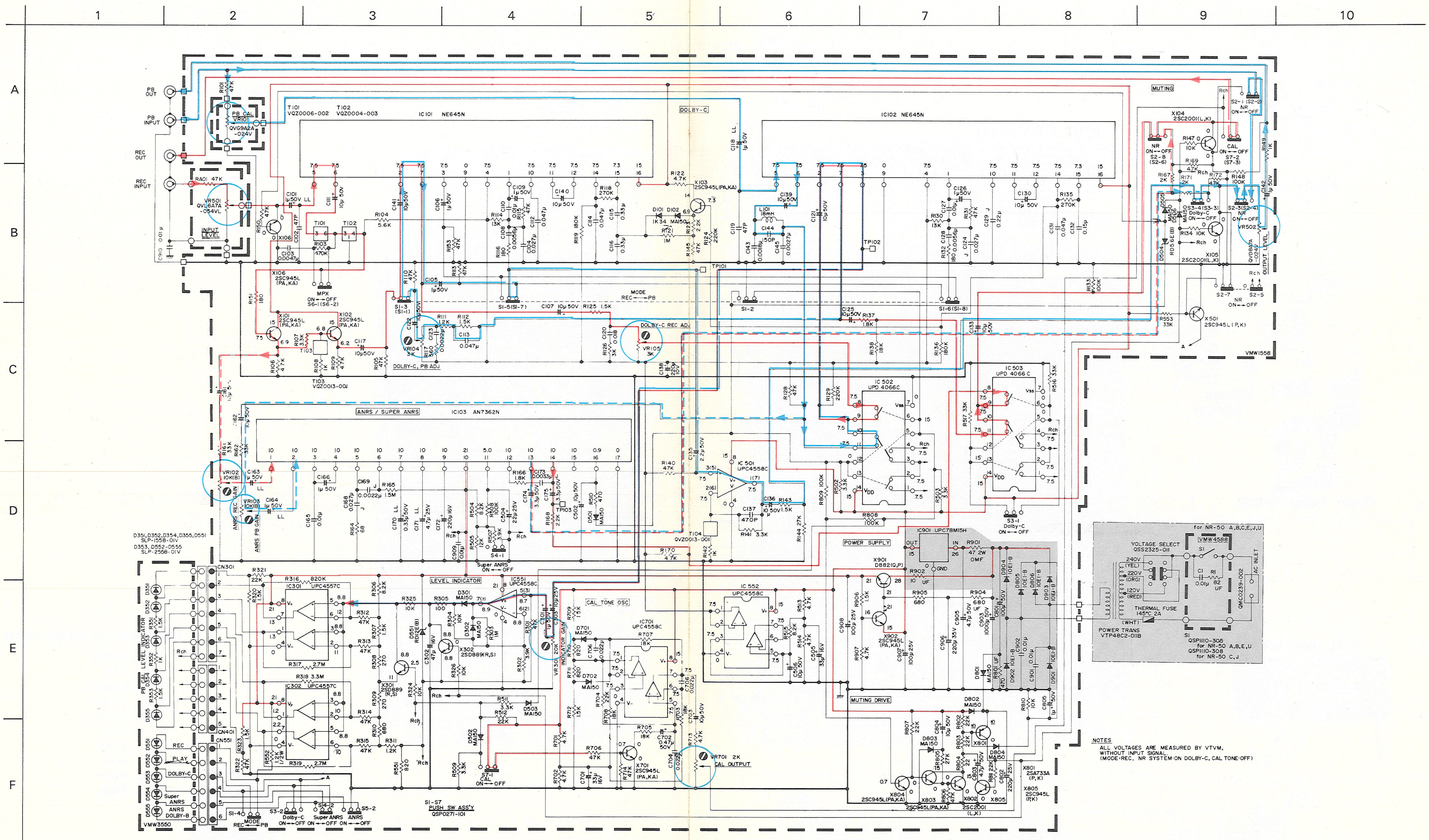

1
2
3
4
5
6
7
8
9
10
A
B
C
D
E
F
G
Pin jack ass'y
In let
Main P.W.B Ass'y
Power transformer
Voltage selector
Power switch P.W.B
CAL level control P.W.B
REC level control P.W.B
CN301
CN401
CN551
Level indicator P.W.B Ass'y
POWER SUPPLY
DOLBY-C
ANRS / Super ANRS
MUTING DRIVE
LEVEL INDICATOR
CAL TONE OSC
CAL TONE
MPX FILTER
ANRS
SUPER ANRS
DOLBY C
NRON
REC PLAY

Color code are shown below

1 .... Brown
2 .... Red
3 .... Orange
4 .... Yellow
5 .... Green
6 .... Blue
7 .... Violet
8 .... Grey
9 .... White
0 .... Black

Fig. 7

Standard Schematic Diagram


1
2
3
4
5
6
7
8
9
10
A
B
C
D
E
F
PB OUT
PB INPUT
REC OUT
REC INPUT
PB CAL VR101 QVG9A2A-024V
VR501 QVL6A7A-054VL
INPUT LEVEL
T101 VQZ0006-002
T102 VQZ0004-003
IC101 NE645N
DOLBY-C
IC102 NE645N
MUTING
X104 2SC2001(L,K)
X103 2SC945L(PA,KA)
X106 2SC945L (PA,KA)
MPX ON←→OFF S6-1(S6-2)
X101 2SC945L (PA,KA)
X102 2SC945L (PA,KA)
T103 VQZ0013-001
DOLBY-C, PB ADJ
MODE REC←→PB
DOLBY-C REC ADJ
X105 2SC2001(L,K)
X501 2SC945L(P,K)
NR ON←→OFF
CAL ON←→OFF
OUTPUT LEVEL VR502 QVD6A7A-024V
VMW1558
ANRS / SUPER ANRS
IC103 AN7362N
IC 502 UPD 4066C
IC 503 UPD 4066 C
IC 501 UPC4558C
T104 QVZ0013-001
S3-1 Dolby-C ON←→OFF
POWER SUPPLY
IC901 UPC78M15H
X901 D882(Q,P)
X902 2SC945L (PA,KA)
VOLTAGE SELECT QSS2325-011
VMW4588
for NR-50 A,B,C,E,J,U
POWER TRANS VTP48C2-011B
THERMAL FUSE 145°C 2A
S1 QSP1110-305 for NR-50 A,B,E,U QSP1110-308 for NR-50 C,J
QMC0239-002
AC INLET
D351,D352,D354,D355,D551 SLP-155B-01V
D353, D552-D555 SLP-255B-01V
CN301
IC301 UPC4557C
IC302 UPC4557C
LEVEL INDICATOR
IC551 UPC4558C
X301 2SD889 (R,S)
X302 2SD889(R,S)
Super ANRS ON←→OFF
CAL TONE OSC
IC701 UPC4558C
IC 552 UPC4558C
VR301 20K INDICATOR GAIN
VR102 10K(B) GAIN
VR103 10K(B) ANRS REC GAIN
ANRS PB GAIN
X701 2SC945L (PA,KA)
VR701 2K CAL OUTPUT
S7-1 CAL ON←→OFF
MUTING DRIVE
X801 2SA733A (P,K)
X802 2SC2001 (L,K)
X803 2SC945L(PA,KA)
X804 2SC945L(PA,KA)
X805 2SC945L (P,K)
CN401
CN551
REC
PLAY
DOLBY-C
Super ANRS
ANRS
DOLBY-B
PB CAL
LEVEL INDICATOR
VMW3550
MODE REC←→PB
S3-2 Dolby-C ON←→OFF
S4-2 Super ANRS ON←→OFF
S5-2 ANRS ON←→OFF
S1-S7 PUSH SW ASS'Y QSP0271-101
NOTES
ALL VOLTAGES ARE MEASURED BY VTVM. WITHOUT INPUT SIGNAL. (MODE:REC, NR SYSTEM:ON DOLBY-C, CAL TONE:OFF)

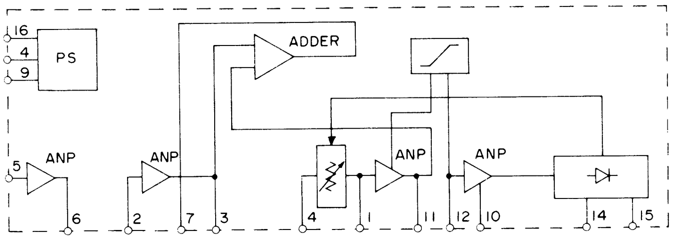
NOTES.

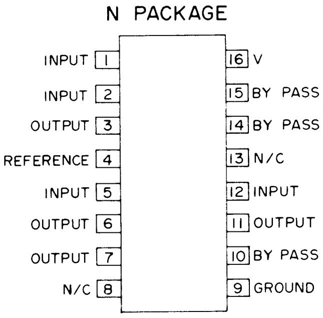
1. Unless otherwise specified, all resistors are 1/4W, ±5% Carbon resistors,
   And all capacitors are 50 V fixed ceramic capacitors or 50V mylar capacitors.
2. UF – Unflammable carbon resistor
   OMF – Oxided metal film resistor
   LL – Low leak current electrolytic capacitor (±20% tolerance)
   PP – Polypropylene capacitor
3. Blue line shows the signal at playback.
   Red line shows the signal at recording and +B circuits.
4. ▨ parts are safety assurance parts. When replacing those parts, make sure to use the specified one.

Fig. 8

Integrant Circuits

IC101, 102, NE645N Dolby C NR circuit


16
4
9
PS
ANP
5
6
ANP
2
7
3
ADDER
ANP
4
1
11
ANP
12
10
14
15


N PACKAGE
INPUT 1
INPUT 2
OUTPUT 3
REFERENCE 4
INPUT 5
OUTPUT 6
OUTPUT 7
N/C 8
16 V
15 BY PASS
14 BY PASS
13 N/C
12 INPUT
11 OUTPUT
10 BY PASS
9 GROUND

IC103 AN7362N ANRS & Super ANRS

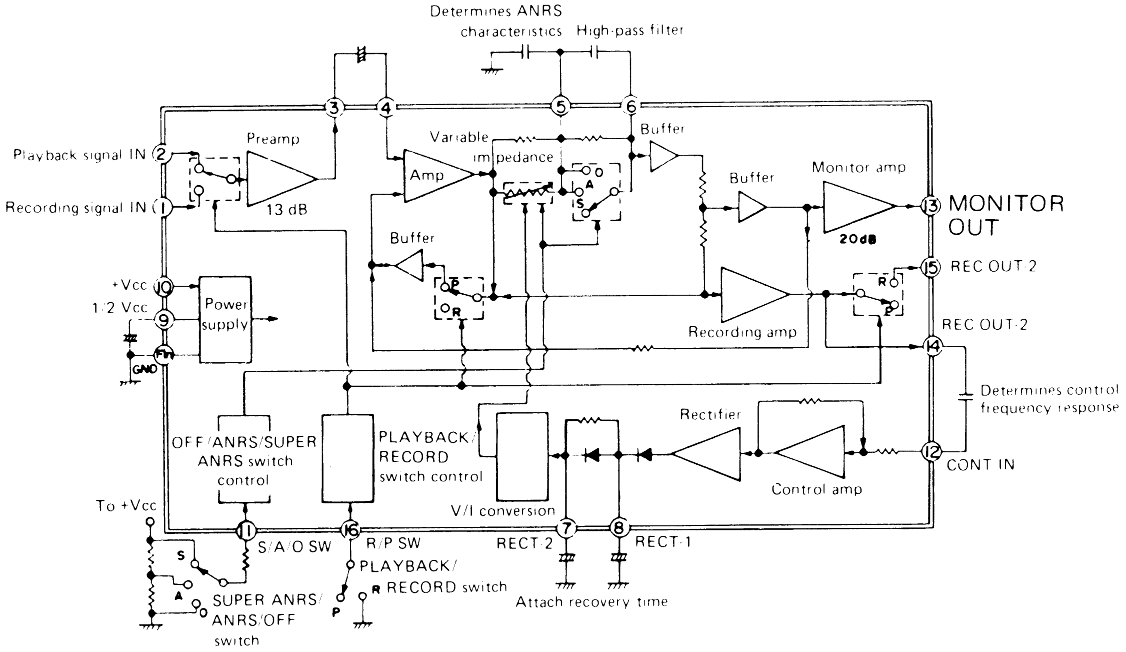

Determines ANRS characteristics
High-pass filter
3
4
5
6
Preamp
Playback signal IN 2
Recording signal IN 1
13 dB
Variable impedance
Amp
Buffer
Buffer
Monitor amp
13 MONITOR OUT
20dB
Buffer
P
R
R
P
15 REC OUT 2
+Vcc 10
1/2 Vcc
9
GND
Power supply
Recording amp
REC OUT 2
14
Determines control frequency response
Rectifier
OFF/ANRS/SUPER ANRS switch control
PLAYBACK/ RECORD switch control
V/I conversion
Control amp
12 CONT IN
To +Vcc
11
16
7
8
S/A/O SW
R/P SW
RECT 2
RECT 1
S
A
O
SUPER ANRS/ ANRS/OFF switch
PLAYBACK/ RECORD switch
R
P
Attach recovery time

Fig. 9

Standard Voltage Value

Voltage values are measured by the following meter without input signal at recording mode.

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
IC101,201 NE645N	E.Voltmeter	Cannot measure	7.5	7.5	7.5	7.5	7.5	7.5	NC(0)	0	7.5	7.5	7.5	NC(0)	7.5	7.3	15.0
	C.Tester		7.3	7.4	7.4	6.0	7.4	7.4	—	0	7.4	7.4	7.3	—	7.3	6.7	15.0
IC102,202 NE645N	E.Voltmeter		7.5	7.5	7.5	7.5	7.5	7.5	NC	0	7.5	7.5	7.5	NC	7.5	7.3	15.0
	C.Tester		7.3	7.4	7.4	6.0	7.3	7.4	—	0	7.4	7.4	7.3	—	7.3	6.8	15.0
IC103,203 AN7362N	E.Voltmeter	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	21.0	5.0	10.0	10.0	10.0	10.0	0.9
	C.Tester	6.4	6.4	10.0	6.4	10.0	10.0	9.8	10.0	10.0	21.0	4.3	10.0	11.0	11.0	11.0	0.9
IC501 UPC4558C	E.Voltmeter	7.5	7.5	7.5	0	7.5	7.5	7.5	15.0								
	C.Tester	7.4	7.4	6.0	0	6.0	7.4	7.4	15.0								
IC502 UPD4066C	E.Voltmeter	7.5	7.5	7.5	7.5	15.0	15.0	0	7.5	7.5	7.5	7.5	0	0	15.0		
	C.Tester	6.3	7.4	7.4	7.4	15.0	15.0	0	7.4	7.4	7.4	6.4	0	0	15.0		
IC503 UPD4066C	E.Voltmeter	7.5	7.5	7.5	7.5	0	0	0	7.5	7.5	7.5	7.5	15.0	15.0	15.0		
	C.Tester	6.8	6.8	6.8	7.2	0	0	0	7.2	6.8	6.8	6.8	15.0	15.0	15.0		
IC301,401 UPC4557C	E.Voltmeter	1.3	11.0	8.8	0	8.8	12.0	1.3	21.0								
	C.Tester	1.3	8.8	8.3	0	8.3	9.7	1.3	21.0								
IC302,402 UPC4557C	E.Voltmeter	1.2	10.0	8.8	0	8.8	10.0	2.2	21.0								
	C.Tester	1.2	8.6	8.3	0	8.3	8.1	2.3	21.0								
IC551 UPC4558C	E.Voltmeter	8.9	8.8	8.7	0	8.7	8.8	8.9	21.0								
	C.Tester	8.8	8.7	7.0	0	7.0	8.7	8.8	21.0								
IC552 UPC4558C	E.Voltmeter	7.5	7.5	7.5	0	7.5	7.5	7.5	15.0								
	C.Tester	7.4	7.4	7.0	0	7.0	7.4	7.4	15.0								
IC701 UPC4558C	E.Voltmeter	7.5	7.5	7.5	0	7.5	7.5	7.5	15.0								
	C.Tester	7.4	7.4	6.8	0	7.4	6.8	7.4	15.0								
IC901		IIN.	OUT	GND													
	E.Voltmeter	26.0	15.0	0													
	C.Tester	26.0	15.0	0													

		E. Voltmeter			C. Tester		
		E	C	B	E	C	B
X101	2SC945L(PA,KA)	6.9	15.0	7.5	6.8	15.0	7.2
X102	2SC945L(PA,KA)	6.2	15.0	6.8	6.2	15.0	6.6
X103	2SC945L(PA,KA)	6.9	14.0	7.3	6.8	15.0	3.6
X104	2SC2001(L,K)	0	0	0	0	0	0
X105	2SC2001(L,K)	0	0	0	0	0	0
X106	2SC945L(P,K)	0	0	0	0	0	0
X301	2SD889(R,S)	11.0	8.8	2.5	11.0	8.2	2.0
X302	2SD889(R,S)	8.8	8.8	0	8.7	8.7	0
X701	2SC945L(PA)	0	0	0.7	0	0	0.6
X901	2SD882(Q,P)	21.0	28.0	21.0	21.0	28.0	21.0
X902	2SC945L(PA,KA)	15.0	21.0	16.0	15.0	21.0	16.0
X801	2SA733A(P,K)	15.0	0	15.0	15.0	0	15.0
X802	2SC2001(L,K)	0	15.0	0	0	15.0	0
X803	2SC945L(PA,KA)	0	15.0	0	0	15.0	0
X804	2SC945L(PA,KA)	0	0	0.7	0	0	0.6
X805	2SC945L(P,K)	0	1~2	0	0	0~2	0

C. Tester = Circuit Tester (20 kΩ impedance)
E. Voltmeter = Electronic Voltmeter
Tape select switch : NORM

Block Diagram

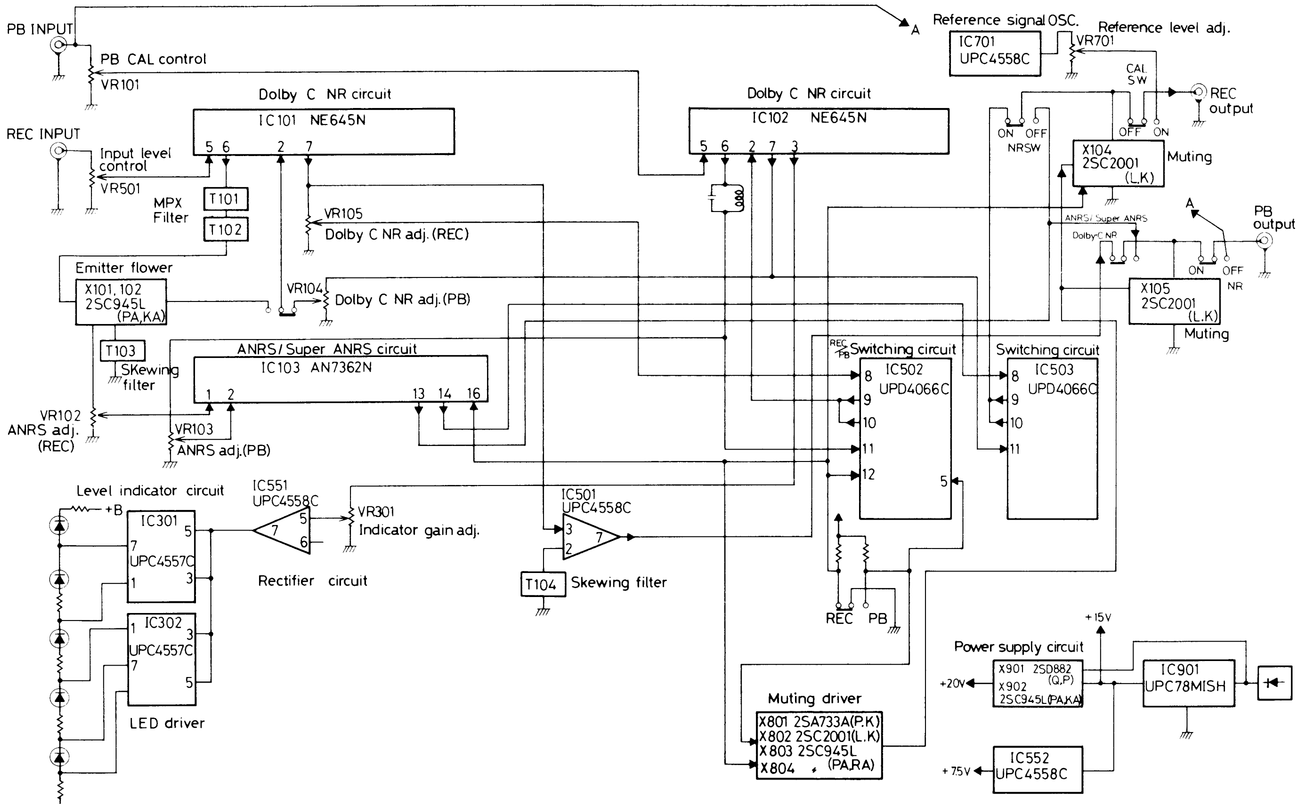

PB INPUT
PB CAL control
VR101
REC INPUT
Input level control
VR501
MPX Filter
T101
T102
Dolby C NR circuit
IC101 NE645N
5 6 2 7
VR105
Dolby C NR adj.(REC)
Emitter flower
X101, 102
2SC945L
(PA,KA)
VR104
Dolby C NR adj.(PB)
T103
Skewing filter
ANRS/Super ANRS circuit
IC103 AN7362N
1 2 13 14 16
VR102
ANRS adj.
(REC)
VR103
ANRS adj.(PB)
A
Reference signal OSC.
IC701
UPC4558C
Reference level adj.
VR701
CAL SW
REC output
Dolby C NR circuit
IC102 NE645N
5 6 2 7 3
ON OFF
NRSW
OFF ON
X104
2SC2001
(L,K)
Muting
A
PB output
ANRS/Super ANRS
Dolby C NR
ON OFF
NR
X105
2SC2001
(L,K)
Muting
REC PB Switching circuit
IC502
UPD4066C
8 9 10 11 12 5
Switching circuit
IC503
UPD4066C
8 9 10 11
Level indicator circuit
+B
IC301
UPC4557C
5 7 1 3
IC302
UPC4557C
1 3 7 5
LED driver
IC551
UPC4558C
5 7 6
VR301
Indicator gain adj.
Rectifier circuit
IC501
UPC4558C
3 7 2
T104
Skewing filter
REC PB
+15V
Power supply circuit
X901 2SD882
X902 (Q,P)
2SC945L(PA,KA)
+20V
IC901
UPC78M15H
Muting driver
X801 2SA733A(P,K)
X802 2SC2001(L,K)
X803 2SC945L
X804 " (PA,RA)
IC552
UPC4558C
+7.5V

Fig. 10

Main Adjustments

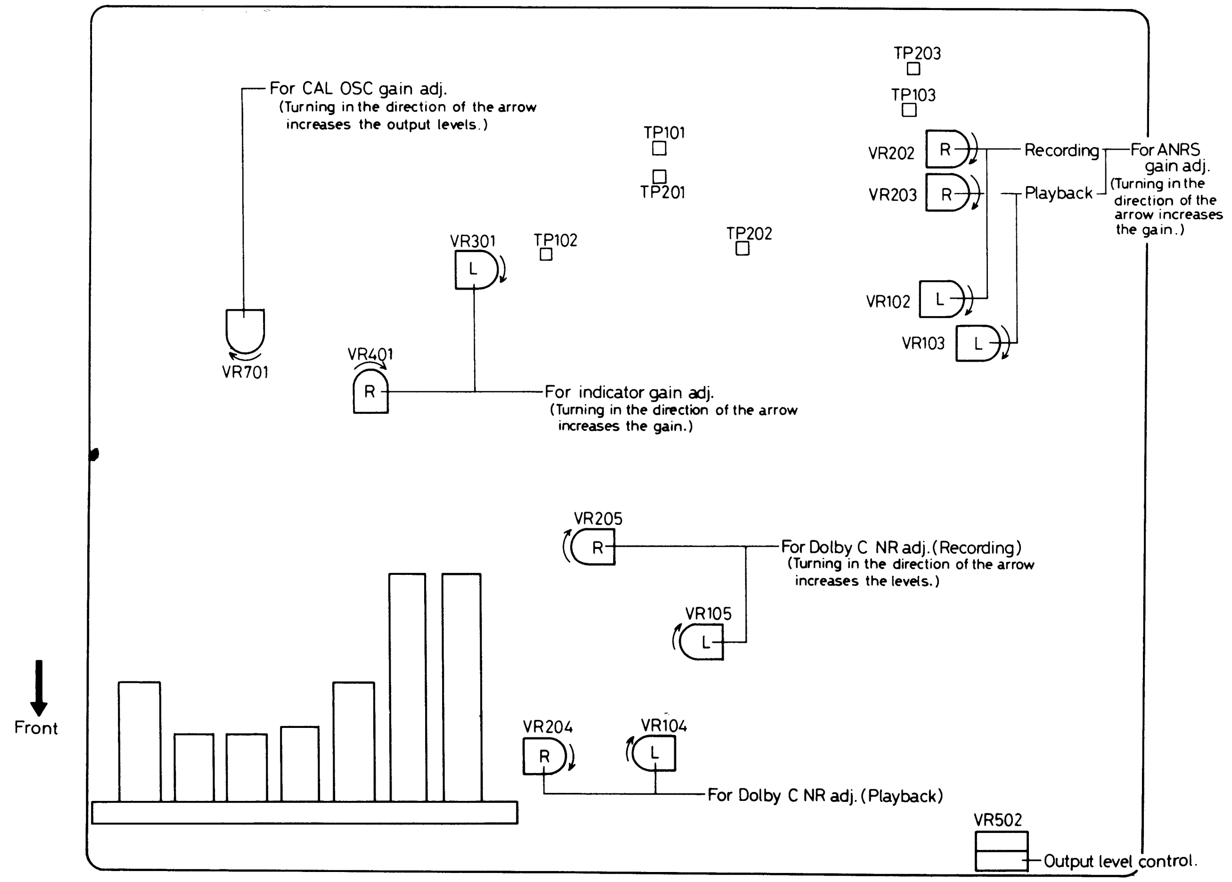

For CAL OSC gain adj.
(Turning in the direction of the arrow increases the output levels.)
VR701
TP101
TP201
TP102
TP202
TP203
TP103
VR301
L
VR401
R
For indicator gain adj.
(Turning in the direction of the arrow increases the gain.)
VR202
R
VR203
R
Recording
Playback
For ANRS gain adj.
(Turning in the direction of the arrow increases the gain.)
VR102
L
VR103
L
VR205
R
For Dolby C NR adj.(Recording)
(Turning in the direction of the arrow increases the levels.)
VR105
L
VR204
R
VR104
L
For Dolby C NR adj.(Playback)
Front
VR502
Output level control.

Fig. 11

Adjustment should be performed in the order of steps 1, 2, 3, . . .

(A) Recording gain adjustment

Switch name Switch position
MODE – REC
NR – OFF
MPX – OFF
CAL – OFF

	Item	Adjustment	Adjusting point	Standard value	Remarks
1	Dolby C NR	Apply 400 Hz, –20 dB signal to the LINE IN terminals. Adjust the input level control until the signal is available –2.5 dBs at the TP101, 201. Next, adjust VR105, 205 so that TP102, 202 signal become –2.5 dBs.	VR105, 205	–2.5 dBs	
2	ANRS	Adjust VR102, 202 so that TP103, 203 signal become 0 dBs.	VR102, 202	0 dBs	After this adjustment, be sure to perform the REC OUT level to become –4 dBs ± 1 dB.

(B) Playback gain adjustment

Switch name Switch position
MODE – PB
NR – OFF
MPX – OFF
CAL – OFF

3	Dolby C NR	Apply 400 Hz, –7 dB signal to the PLAY IN terminals. Adjust the PB level control until the signal is available –2.5 dBs at the TP102, 202. Next, adjust VR104, 204 so that TP101, 201 become –2.5 dBs.	TP101, 201	–2.5 dBs	
4	ANRS	Adjust VR103, 203 so that TP103, 203 become 0 dBs.			After this adjustment, be sure to perform the LINE OUT level to become –7 dBs ± 1 dB as same as PLAY IN level. Next, push on the NR switch, and then be sure to perform the LINE OUT level to become –4 dBs ± 1 dB.

(C) Level indicator gain adjustment

Switch name Switch position
MODE – REC
NR – OFF
MPX – OFF
CAL – OFF

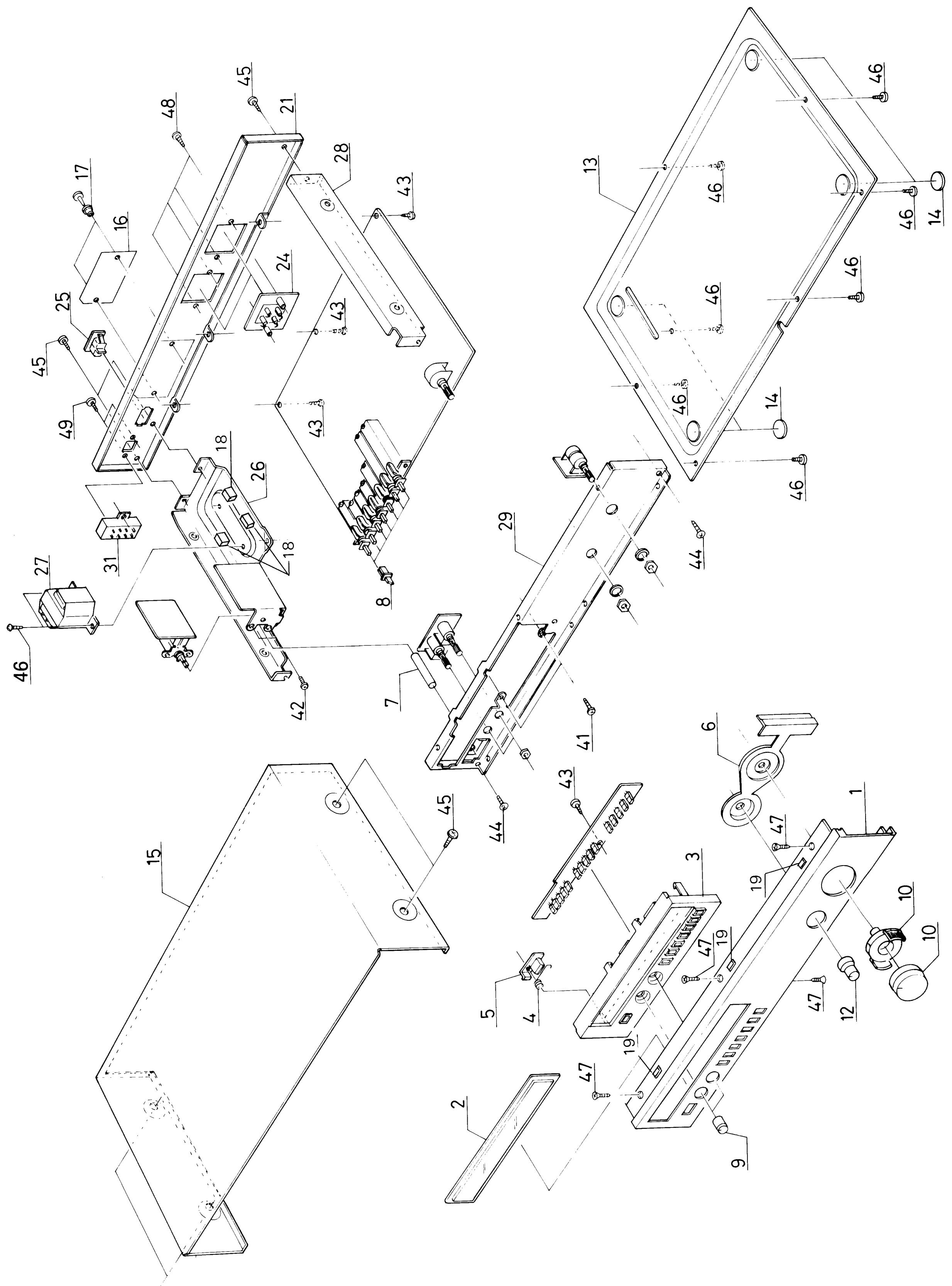
	Item	Adjustment	Adjusting point	Standard value	Remarks
5	Level indicator gain	Apply 1 kHz signal to the LINE IN terminals. Adjust the input level control until the signal is available –4 dBs at the REC OUT level. Adjust VR301, 401 so that the REF LED light, and when its signal attenuate 0.6 dB, be sure to perform (–) LED lightes small. – REF + ▶ ■ ◀ 0.6 dB 0.6 dB	VR301, 401	0.6 dB	

(D) CAL OSC gain adjustment

Switch name Switch position
MODE – REC
NR – OFF
MPX – OFF
CAL – ON

6	CAL OSC gain	Adjust VR701 so that REC OUT level become –4 dBs, the same time, be sure to perform the osc. frequency to become 370 Hz ± 10%	VR701	370 Hz ± 10%	

Enclosure Assembly and Electrical Parts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1
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12
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47
2
9
45

Fig. 12

Enclosure Assembly and Electrical Parts List (except P.W. Board)

Ref. No.	⚠	Parts No.	Parts Name	Remarks	Q'ty
1~6		ZCNR50Y-CBF	Front Plate Sub Ass'y		1
1		VJC1172-002	Front Plate		1
2		VJK3177-001	Finder		1
3		VJD2176-001	L.E.D. Escutcheon		1
4		VKW4265-002	Button Spring		1
5		VXP4087-001	Push Button	for Power	1
6		VJD3279-001	Volume Escutcheon		1
7		VKS4003-006	Pipe		1
8		VXP4088-001	Push Button		7
9		VXL4132-00A	Knob	for Cal. Level	2
10		VXL4128-001	Volume Knob	Input (R)	1
11		VXL4127-00A	Knob Ass'y	Input (L)	1
12		VXL4103-00B	"	Output	1
13		VJC2048-001	Bottom Cover		1
14		VJF4003-002	Foot		4
15		VJC1171-001	Top Cover		1
16		VYNA410-002	Name Plate		1
17		E48729-002	Plastic Rivet		2
18		VYSR106-010	Spacer	for Power Transformer	3
19		VYSR101-003	Spacer	for Top Cover	3
21		VJC2046-002	Rear Panel		1
22	⚠	QMP2530-200	Power Cord	NR-50A	1
	⚠	QMP9017-009BS	"	NR-50B	1
	⚠	QMP1230-183	"	NR-50C/J	1
	⚠	QMP3950-183	"	NR-50E	1
	⚠	QMP7630-183	"	NR-50U	1
24		VMJ3003-001	Pin Jack Ass'y	NR-50A/B/E/U	1
		VMJ3003-001	"	NR-50C/J	1
25	⚠	QMC0239-002BS	AC Inlet	NR-50A/B/E/U	1
	⚠	QMC0239-002	"	NR-50C/J	1
26		VKL2137-001	Trans. Bracket		1
27	⚠	VTP48C2-011BBS	Power Trans.	NR-50A/B/E/U	1
	⚠	VTP48C2-011B	"	NR-50C/J	1
28		VKL3304-001	Angle		2
29		VKL2136-001	Front Bracket		1
30		QHX2075-001	Wire Clamp		10
31	⚠	QSS2325-011BS	Voltage Select Switch	NR-50A/B/E/U	1
	⚠	QSS2325-011	"	NR-50C/J	1
41		LPSP3006VS	Screw	Push Switch — Front Bracket	2
42		LPSP3006ZS	"	Push Switch	2
43		SBSB3006V	"	LED P.W.B. x 1, Main P.W.B. x 3	4
44		SBSB3006Z	"	Bracket Angle x 2	2
45		SDSB3006R	"	Top Cover x 4, Rear Angle Trans. Bracket x 3	7
46		SDST3006Z	"	Bottom Cover x 7, Transformer x 2	9
47		SSSB3006Z	"	Front Bracket	4
48		SDSB3008R	"	Pin Jack Ass'y	4
49		SDSP3006RS	"	Voltage Select Switch	1

Main P.W. Board Parts

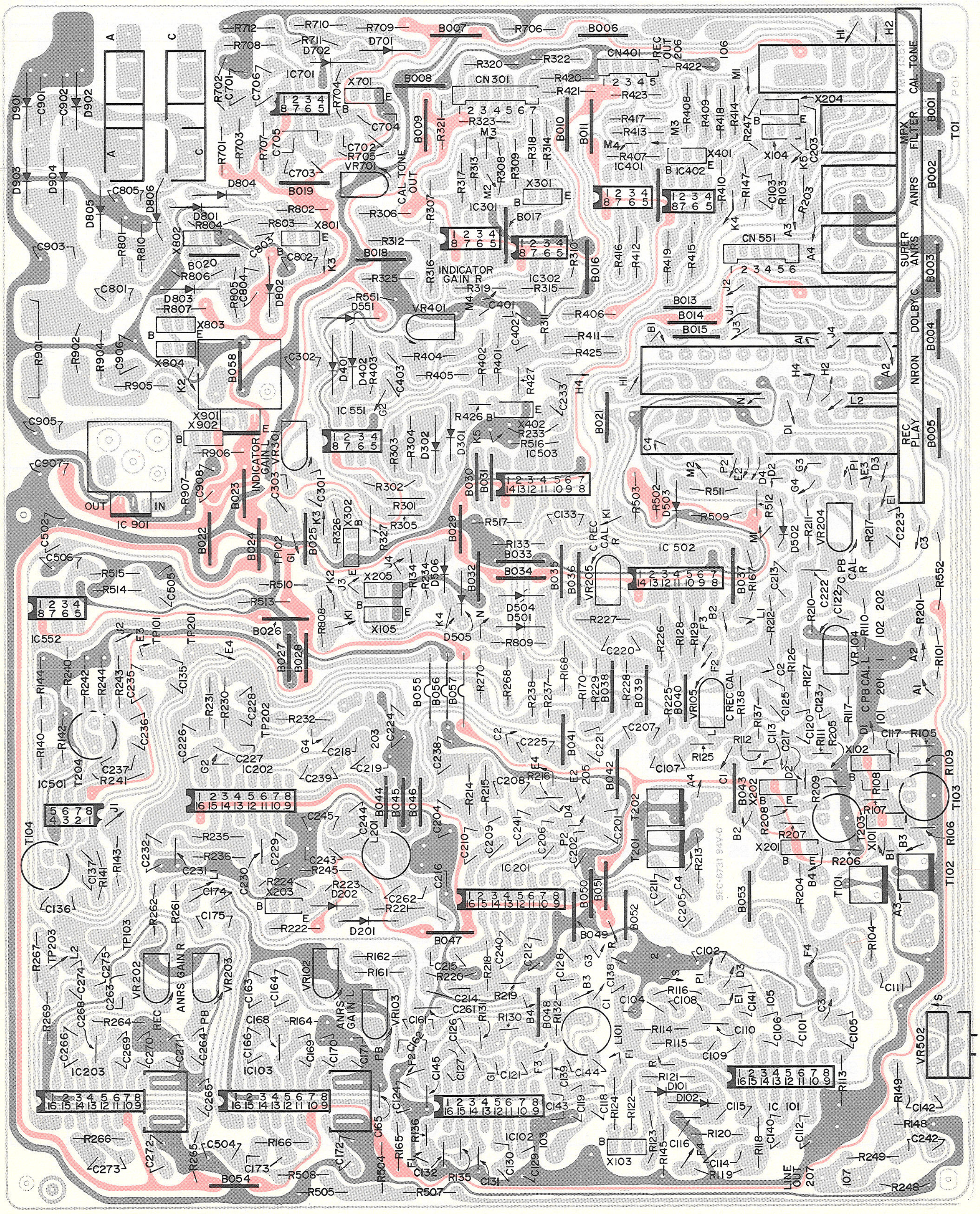

REC OUT 206
106
CN401
CN301
IC701
VR701
CAL TONE OUT
IC301
IC302
IC401
IC402
INDICATOR GAIN R
VR401
CN 551
H1
H2
CAL TONE
MPX FILTER
ANRS
SUPER ANRS
DOLBY C
NRON
REC PLAY
B001
B002
B003
B004
B005
T01
IC 551
IC503
IC 502
INDICATOR GAIN L
VR301
OUT
IN
IC 901
IC552
C REC CAL
VR205
C PB CAL R
C REC CAL L
VR105
C PB CAL L
VR104
IC202
IC201
IC501
T104
T204
T103
T203
T101
T102
T201
T202
ANRS GAIN R
VR202
REC
PB
VR203
VR102
ANRS GAIN L
VR103
IC203
IC103
IC102
IC 101
103
105
107
LINE OUT 207
VR502
SEC-6731 94V-0

Fig. 13

🟥 +B

⬛ Earth

Main P.W. Board Parts List

Ref. No.	⚠	Parts No.	Parts Name	Remarks	Q'ty
		VMW1558-001	P.W. Board		1
R101, 201, 113, 213, 115, 215, 128, 228, 140, 240, 145, 245, 231, 312, 412, 313, 413, 314, 414, 315, 415, 322, 422, 401, 422, 706, 153, 253, 110, 210		QRD141J-473S	C. Resistor	47 kΩ 1/4 W	30
R103, 203		″ -474S	″	470 kΩ ″	2
R104, 204		QRD147J-562S	″	5.6 kΩ ″	2
R105, 205, 131, 231, 150, 250, 714		QRD143J-473S	″	47 kΩ ″	7
R106, 206, 109, 209, 169. 512, 713, 172, 272		″ -472S	″	4.7 k Ω ″	9
R107, 207		″ -332S	″	3.3 kΩ ″	2
R108, 208		″ -102S	″	1 kΩ ″	2
R133, 233, 508		QRD141J-104S	″	100 kΩ ″	3
R111		QRD143J-222S	″	2.2 kΩ ″	1
R211, 123		QRD141J-122S	″	1.2 kΩ ″	2
R112 225,		QRD143J-152S	″	1.5 kΩ ″	2
R212, 143, 243, 307, 407, 709, 712, 904, 905, 906		QRD141J-152S	″	1.5 kΩ ″	10
R114, 214, 230		QRD147J-133S	″	13 kΩ ″	3
R116, 216, 132, 232, 151, 251		QRD141J-181S	″	180 Ω ″	6
R117, 217		″ -561S	″	560 Ω ″	2
R118, 218, 235		″ -274S	″	270 kΩ ″	3
R119, 236		″ -184S	″	180 kΩ ″	2
R121, 221, 303, 403		″ -105S	″	1 MΩ ″	4
R122, 222, 170, 270, 269, 513, 514, 701, 702, 907		″ -472S	″	4.7 kΩ ″	10
R124, 224, 129, 229		″ -224S	″	220 kΩ ″	4
R125		QRD143J-152S	″	1.5 kΩ ″	1
R302, 507		QRD141J-392S	″	3.9 kΩ ″	2
R126, 226, 402		QRD147J-302S	″	3 kΩ ″	3
R505		QRD141J-123S	″	12 kΩ ″	1
R130		QRD143J-133S	″	13 kΩ ″	1
R134, 234, 147, 247, 304, 404, 325, 425, 326		″ -103S	″	10 kΩ ″	9
R135		″ -274S	″	270 kΩ ″	1
R136, 219		″ -184S	″	180 kΩ ″	2
R137, 237, 166, 266		QRD141J-182S	″	1.8 kΩ ″	4
R138, 238, 703, 705, 707, 708		″ -183S	″	18 kΩ ″	6
R141, 241, 502, 503, 509, 511		″ -332S	″	3.3 kΩ ″	6
R142, 242		″ -101S	″	100 Ω ″	2
R144, 244		″ -273S	″	27 kΩ ″	2
R148, 248		QRD147J-104S	″	100 kΩ ″	2
R149, 249		″ -102S	″	1 kΩ ″	2
R161, 261, 162, 262, 516,517, 553		QRD141J-333S	″	33 kΩ ″	7
R164, 264		″ -680S	″	68 Ω ″	2
R165, 265		QRD147J-155S	″	1.5 MΩ ″	2
R167, 267		QRD147J-202S	″	2 kΩ ″	2
R168, 268, 223		QRD141J-222S	″	2.2 kΩ ″	3
R305, 327, 427		QRD143J-101S	″	100 Ω ″	3
R405		QRD141J-101S	″	100 Ω ″	1
R306, 406, 504, 515		″ -822S	″	8.2 kΩ ″	4
R308, 408, 309, 409		″ -271S	″	270 Ω ″	4

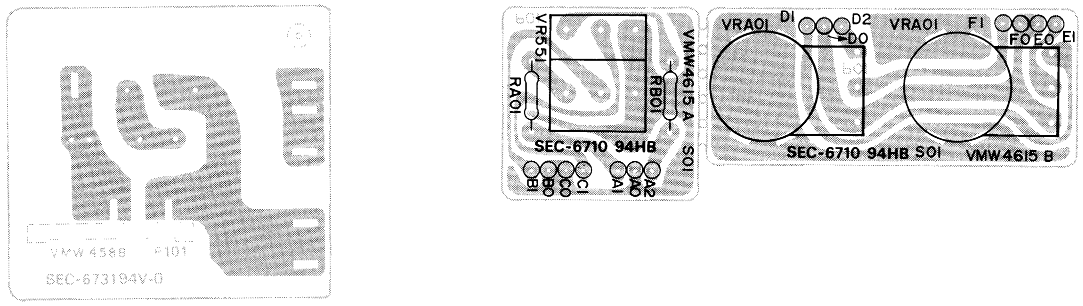
Ref. No.	⚠	Parts No.	Parts Name	Remarks	Q'ty
R310, 410, 905		QRD141J-681S	C. Resistor	680 Ω 1/4 W	3
R311, 411		″ -122S	″	1.2 kΩ ″	2
R316, 416		″ -824S	″	820 kΩ ″	2
R317, 417		″ -275S	″	2.7 MΩ ″	2
R318, 418		″ -335S	″	3.3 MΩ ″	2
R319, 419		″ -275S	″	2.7 MΩ ″	2
R320, 420, 323, 423	⚠	″ -152S	″	1.5 kΩ ″	4
R321, 421, 704, 811		″ -223S	″	22 kΩ ″	4
R324, 424, 426		QRD143J-103S	″	10 kΩ ″	3
R551, 710, 711		QRD141J-821S	″	820 Ω ″	3
R552		QRD121K-122	″	1.2 kΩ ″	1
R901	⚠	QRG029J-470	OMF Resistor	47 Ω ″	1
R902	⚠	QRD149J-100S	C. Resistor	10 Ω ″	1
R904		″ -681S	″	680 Ω ″	1
VR102, 202, 103, 203		QVP8A0B-014	V. Resistor	10 kΩ	4
VR104, 204, 105, 205		QVP8A0B-033	V. Resistor	3 kΩ	4
VR701		″ -023	″	2 kΩ	1
VR301, 401		″ -024	″	20 kΩ	2
VR502		QVD8A7A-024V	″	20 kΩ	1
C101, 201, 118, 218, 163, 263, 164, 264		QEB41HM-105M	E. Capacitor	1 μF 50 V	8
C119, 219		QCS11HK-470	C. Capacitor	47 pF ″	2
C173, 273		QFM41HJ-332	Mylar Capacitor	0.0033 μF ″	2
C102, 202		QCS11HK-470	C. Capacitor	47 pF ″	2
C103, 203		QFM41HJ-472	C. Capacitor	0.0047 pF ″	2
C104, 204, 124, 224, 168, 268		″ -273	″	0.027 μF ″	6
C105, 205, 106, 206, 142, 242, 166, 266, 301, 401, 109, 209, 126, 226		QET41HR-105N	E. Capacitor	1 μF ″	14
C107, 207, 111, 211, 117, 217 121, 221, 122, 222, 125, 225, 130, 230, 133, 233, 136, 236, 139, 239, 140, 240, 141, 241, 161, 261, 162, 262, 303, 403, 502, 506, 703		″ -106N	″	10 μF ″	33
C108, 208, 128, 228		QFM41HJ-562	Mylar Capacitor	0.0056 μF ″	4
C110, 210, 127, 227		″ -103	″	0.01 μF ″	4
C112, 212, 113, 213		″ -473	″	0.047 μF ″	4
C114, 214, 131, 231		QFM41HK-473	″	0.047 μF ″	4
C115, 215, 116, 216		QFV81HJ-334	″	0.33 μF ″	4
C120, 220		QFM41HJ-183	″	0.018 μF ″	2
C123, 223, 169, 269		″ -222	″	0.0022 μF ″	4
C129, 229		QFV81HJ-224	″	0.22 μF ″	2
C132, 232		″ -154	″	0.15 μF ″	2
C135, 235		QET41HR-225N	E. Capacitor	2.2 μF ″	2
C137, 237		QCS11HK-471	C. Capacitor	470 pF ″	2
C138, 238		QET41AR-227N	E. Capacitor	220 μF 10 V	2
C143, 243		QFM41HJ-182	Mylar Capacitor	0.0018 μF 50 V	2
C144, 244		QCS11HJ-151	C. Capacitor	150 pF ″	2
C145, 245		QFM41HJ-272	Mylar Capacitor	0.0027 μF ″	2
C165, 265		QFM41HK-103	″	0.01 μF ″	2
C170, 270		QEB41HM-334M	E. Capacitor (Low Leak)	0.33 μF ″	2
C171, 271		″ -475M	″	4.7 μF ″	2
C172, 272		QET41CR-227N	E. Capacitor	220 μF 16 V	2
C174, 274, 175, 275		QET41HR-335N	″	3.3 μF 50 V	4
C302, 402		QET41ER-476N	″	47 μF 25 V	2
C504		QET41ER-226N	″	22 μF 10 V	1

Ref. No.	⚠	Parts No.	Parts Name	Remarks	Q'ty
C505, 701		QET41CR-336N	″	33 μF 16 V	2
C702		QET41HR-474N	″	0.47 μF 10 V	1
C704, 705, 706		QFM41HJ-223	Mylar Capacitor	0.022 μF 50 V	3
C901, 902		QCF12HP-103	C. Capacitor	0.01 μF ″	2
C903		QET41HR-108N	E. Capacitor	1000 μF ″	1
C905		″ -475N	″	4.7 μF ″	1
C906		QET41VR-227N	″	220 μF 35 V	1
C907, 908		QET41ER-107N	″	100 μF 25 V	2
C909		QCF11HP-103	C. Capacitor	0.01 μF 50 V	1
C910		″ -473	″	0.047 μF 50 V	1
D101, 201		1K34A	Ge. Diode	Unizon	2
D102, 202, 701, 702		MA150	Si. Diode	Matsushita	4
D301, 401, 302, 402, 501, 502, 503, 505, 506, 801–804		″	″	Matsushita, or 1SS148	13
D504		RD5.6E(B)	Zener Diode	NEC	1
D551		RD12E(B)	″	″	1
D805, 806		10E1-B	Si. Diode	Nihon Inter	2
D901–904	⚠	″	″	″	4
X101, 201, 102, 202, 103, 203, 701, 902, 803~805, 106, 206 501		2SC945L(PA,KA)	Transistor	NEC	13
X104, 204, 105, 205, 802		2SC2001(L,K)	″	″	5
X301, 401, 302, 402		2SD889(R,S)	″	Matsushita	4
X801		2SA733A(P,K)	″	NEC	1
X901	⚠	2SD882(Q,P)	″	″	1
IC101, 201, 102, 202		NE645N	I.C.		4
IC103, 203		AN7362N	″	Matsushita	2
IC301, 401, 302, 402		UPC4557C	″	NEC	4
IC501, 551, 552, 701		UPC4558C	″	″ or AN6552	4
IC502, 503		UPD4066C	″	″ or TC4066BP	2
IC901	⚠	UPC78M15H	″	″	1
T101, 201		VQZ0006-002	Filter	95 kHz	2
T102, 202		VQZ0004-003	″	19 kHz	2
T103, 203, 104, 204		VQZ0013-001	″	Skewing	4
L101, 201		VQP0001-183	Inductor		2
		*QSP0271-101	Push Switch		1
CN301		QMV5005-007	Plug Ass'y		1
CN401		″ -005	″		1
CN551		″ -006	″		1
		VMH4003-001	Heat Sink	X9	1
		SSSP3006ZS	Screw	for Heat Sink	2
		DPSP3008ZS	″	X9	1
		VMH4003-001	Heat Sink	IC901	1
		SSSP3006ZS	Screw	for Heat Sink	2
		DPSP3008ZS	″	IC901	1
		E43727-002	Wrapping Tab		24
B001		V44611-004	Bus Wire		1
		″ -009	″	15 mm	3
B002–054, 058		QWY123-019	″		55

Other P.W. Board Parts

Push SW

VR


VMW 4588 P101
SEC-673194V-0
VR551
RA01
VMW4615 A
RB01
SEC-6710 94HB
S01
B1 B0 C0 C1 A1 A0 A2
VRA01
D1
D2
D0
VRA01
F1
F0 E0 E1
SEC-6710 94HB S01
VMW4615 B

LED

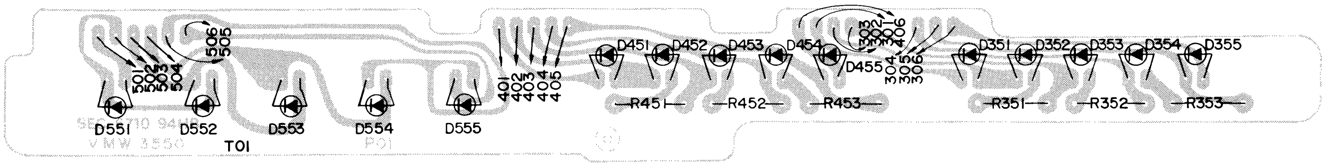

501 502 503 504
506 505
D551
D552
D553
D554
D555
T01
VMW 3550
P01
401 402 403 404 405
D451 D452 D453 D454 D455
R451 R452 R453
301 302 303 304 305 306
D351 D352 D353 D354 D355
R351 R352 R353

Fig. 14

Other P.W. Board Parts List

Ref. No.	⚠	Parts No.	Parts Name	Remarks	Q'ty
[Push Switch]		VMW4588-101	P.W. Board		1
	⚠	QSP1110-305BS	Push Switch	NR-50A/B/E/U	1
	⚠	QSP1110-308	"	NR-50C/J	1
C1	⚠	QFZ9010-103	C. Capacitor	NR-50A/B/E/U	1
	⚠	QCZ9014-103	"	NR-50C/J	1
R1	⚠	QRD149J-820S	Fail Safety Resistor	82 Ω 1/4 W	1
		E40130-001	Tab		3
[LED P.W. Board]		VMW3550-001	P.W. Board		1
D351, 451, 352, 452, 354, 454, 355, 455, 551	⚠	SLP-155B-01V	LED	Red	9
D353, 453, 552–554	⚠	SLP-255B-01V	"	Green	6
R351, 451, 353, 453	⚠	QRD147J-152S	C. Resistor	1.5 kΩ 1/4 W	4
R352, 452	⚠	" -821S	"	820 Ω "	2
[VR P.W.Board]		VMW4615-001	P.W. Board		1
		VMW4615-***A			
RA01, B01		QRD147J-473S	C. Resistor	47 kΩ 1/4 W	2
VR551		QVL6A7A-054VL	V. Resistor	50 kΩ	1
		VMW4615-***B	P.W. Board		1
VRA01, B01		QVG9A2A-024V	V. Resistor	20 kΩ	2

Packing

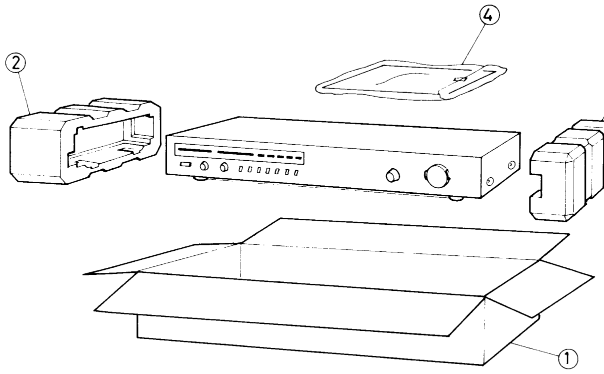


Fig. 15

Position of controls and switch knobs at renewed packing.

Power switch	:	OFF
Timer switch	:	OFF
NR switches	:	OFF
Tape select switches	:	SF/NORM
Input level control	:	DOWN
Input balance	:	Center
Start switch	:	OFF
Preset switch	:	OFF
Monitor switch	:	SOURCE
Meter switch	:	VU
Counter	:	0
Mecha. operation buttons	:	OFF

Packing Material Parts List

Ref. No.	Parts No.	Parts Name	Remarks	Q'ty
1	VPD9048-J02	Carton	NR-50A/B/E/J/U	1
	" -J03	"	NR-50C	1
2	VPH2148-001	Cushion	Left	1
3	VPH2149-001	"	Right	1
	QPGA050-05005	Envelope	for Unit	1
4	AP4056B-077	"	for Instruction Book	1
	TKS000501-04	Sheet	for Unit	1
	AP4056A-036	Envelope	for Provided Cord, Power Cord	2

Accessories

Parts No.	Parts Name	Remarks	Q'ty
VMP0002-00B	PIN Cord		2
VNN0080-301	Instruction Book	NR-50B/E	1
" -901	"	NR-50A/C/J/U	1
BT20029B	Warranty Card	NR-50A	1
BT20025D	"	NR-50C	1
BT20047B	"	NR-50J/U for PX, EES	1
BT20032B	"	NR-50B	1
BT20013C	Guarantee Certificate	NR-50B	1
BT20046	Safety Reply Card	NR-50J/U for PX, EES	1
BT20044B	Safety Instruction	NR-50J	1
TJL000443-01	Seal	Made in Japan, NR-50B	1
	BEAB Label	NR-50B	1
VND4013-001	Warning Label	for Disconnection, NR-50A/B/E	1
QZL1002-003BS	"	for 2-pin Power Cord, NR-50B	1
T44362-001	CSA Marker	NR-50C	1
TLT000505-01	UL/CSA Caution Card	NR-50C/J	3
VNC5311-101	Caution Card	NR-50U for EES	1
E7795-1	EP Mark	NR-50U	1
V04062-002	Simens Plug	NR-50U/E	1
T46328-001	Caution Label	NR-50U	1
E66416-003	Envelope	for Warranty Card	1